Air Force Research Laboratory|AFRL

Science and Technology for Tomorrow's Air and Space Force

Success Story

IPNVGs INCREASE VIEW, SITUATIONAL AWARENESS, AND PROTECTION

The Human Effectiveness Directorate's Integrated Panoramic Night Vision Goggle (IPNVG) system provides aircrew members with increased viewing and unsurpassed situational awareness at night, offers protection from lasers, and causes less neck fatigue during long missions. General Michael Ryan, former Air Force Chief of Staff, stated the Air Force needs panoramic night vision goggles (PNVGs) in the field….fast! This declaration prompted the recent transition of this technology to the Aeronautical Systems Center for system development and demonstration and eventual production.

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Accomplishment

Night Vision Goggles (NVGs) offer tactical advantages in both air and ground arenas, but the currently fielded system—the AN/AVS-9—provides only a limited 40° circular field-of-view (FOV). The IPNVG, however, generates an intensified FOV that is one and one-half times larger than the AN/AVS-9.

The IPNVG achieves increased FOV by using four smaller (16 mm format) image intensifier (I2) tubes rather than the two traditional (18 mm format) I2 tubes. The IPNVG's ultrawide, 95° FOV significantly improves night navigation, targeting, weapons delivery, and search and rescue by allowing advanced tactics during night missions.

The IPNVG integrates laser-hardening technology, accommodates prescription and laser eyewear, and has a highly producible straight-through optical design in all four channels. The IPNVG eliminates some current maintenance requirements, such as purging with nitrogen every 90 days, and also incorporates numerous maintenance-friendly elements including separate but interchangeable parts for solder-free repairs.

Background

Warfighters are evaluating the operational usefulness of the new IPNVG design on various Air Force platforms including the A-10, F-15, F-16, and HH-60. An extensive field survey showed that most pilots desire an increased FOV, but not at the expense of reduced resolution.

Previous day and night visual studies indicate the optimal FOV should be between 80º and 100º. To meet this requirement, the directorate initiated a Small Business Innovation Research (SBIR) program and produced a PNVG concept demonstrator.

The follow-on Phase II SBIR produced seven low-profile prototypes (PNVG Model I) designed for ejection-seat aircraft. The Phase II SBIR also provided five more prototypes (PNVG Model II), whose traditional NVG design complements existing NVG mounts.

Warfighters evaluated these systems on transport and rotary-wing aircraft as well as for ground personnel use. Directorate researchers collected performance data and obtained invaluable pilot design inputs after evaluating operational utility for Air Force warriors aboard multiple aircraft. These inputs provided the basis for the IPNVG program.

Human Effectiveness
Support to the Warfighter

Additional information

To receive more information about this or other activities in the Air Force Research Laboratory, contact TECH CONNECT, AFRL/XPTC, (800) 203-6451 and you will be directed to the appropriate laboratory expert. (03-HE-04)